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Pantothenic Acid Status of Adolescents

Brenda Ringer Eissenstat
Utah State University

PANTOTHENIC ACID STATUS OF ADOLESCENTS

by

Brenda Ringer Eissenstat

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Brenda R. Eisenstat

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ABSTRACT

Pantothenic Acid Status of Adolescents

by

Brenda Ringer Eissenstat, Master of Science

Utah State University, 1986

Major Professor: Dr. Bonita W. Wyse
Department: Nutrition and Food Science

Information on human needs for pantothenic acid is limited and no recommended daily allowance has been established; although a safe and adequate level of 4-7 mg/day has been suggested for adults and adolescents. The adolescent population is often at risk for nutritional problems because of unusual eating patterns and major physiological changes which occur at this time. Pantothenic acid levels in urine, whole-blood and erythrocytes were determined in a healthy adolescent population using radioimmunoassay techniques. Dietary intakes were calculated from 4 day diet records and evaluated using a computer data base developed at Utah State University in conjunction with USDA.

Forty-nine percent of the females and 15 percent of the males consumed less than 4 mg/day; however average blood levels for both males and females were in a "normal" range relative to other populations (411.9 ± 102.8 ng/ml and 344.5 ± 113.6 ng/ml, respectively). Dietary intake was highly correlated to urinary excretion ($p < 0.001$). Levels of pantothenic acid in erythrocytes correlated well to dietary intake and urinary excretion. A model was

developed to predict circulating levels of pantothenic acid from dietary intake and urinary excretion.

(49 pages)

INTRODUCTION

Pantothenic acid studies for all age groups have been very limited and thus the Food and Nutrition Board of the National Academy of Science cites insufficient evidence for establishing a recommended dietary allowance. It has, however, established a dietary intake of 4-7 mg of pantothenic acid per day as an estimated safe and adequate level for adolescents and adults indicating that a higher level may be needed by pregnant and lactating women (1). Further research on the average needs of a healthy and representative segment of each age group and the range of variability among individuals within each group is needed to establish a sufficient data base from which recommended daily allowances can be suggested.

Pantothenic acid has been recognized as a "growth factor" since the 1930's when it was first isolated from yeast (2). Later it was recognized as an essential nutrient for all vertebrates and many microorganisms. However, means of detecting and evaluating pantothenic acid status in humans have been limited and the body of basic research on the vitamin has remained small.

The biochemical functions of pantothenic acid center primarily on two important co-factors; coenzyme A and phosphopantetheine in which pantothenic acid is the vitamin moiety. Coenzyme A is an important catalyst of biologic acylation reactions. The active site of the molecule is the terminal sulfhydryl group. All known acyl derivatives of coenzyme A are thiol esters (3). Coenzyme A is enzymatically involved in acetylation of choline and certain aromatic amines such as sulfonamides, oxidation of fatty acids, pyruvate, α-

-ketoglutarate and acetaldehyde and synthesis of fatty acids, cholesterol, sphingosine, citrate, acetoacetate, porphyrin and sterols (3,4).

Phosphopantetheine is found bound to a protein commonly referred to as the acyl carrier protein (ACP) which appears to be involved in fatty acid synthesis. The fatty acids formed may be converted to triglycerides via their fatty acyl coenzyme A esters.

The cofactors, coenzyme A and phosphopantetheine are involved in at least 72 enzymatic reactions (5). The biochemical reactions in which pantothenic acid is involved lead to a variety of pathological changes in most tissues of the body. Much of the original research on pantothenic acid deficiencies was collected from observations of animals at a time when the knowledge of other B vitamins was also emerging. Therefore many of the observed pantothenic acid deficiency symptoms may reflect multiple vitamin deficiencies.

Deficiency symptoms in experimental animals vary greatly from species to species but several broad categories include most of the symptoms noted: 1. Failure to grow, loss of weight, sudden death; 2. Lesions of skin, hair or feathers; 3. Neural disorders; 4. Gastrointestinal symptoms; 5. Inhibition of antibody formation; and 6. Changes in the adrenal gland or hormone deficiency (3,4,6-9).

In humans, deficiency symptoms have not been observed except possibly as a component of multiple B-vitamin deficiency or other malnutrition. However, subjects on pantothenic acid deficient diets concurrently with a pantothenic acid antagonist, omega methyl pantothenic acid, did develop deficiency symptoms of vomiting,

malaise, abdominal distress, burning cramps, tenderness in the heels, fatigue and insomnia (10-12); however, the validity of this study was limited by a small sample size and large variations among subjects. Pantothenic acid deficiencies have been shown to depress humoral antibody responsiveness to various antigens in experimental animals and man but have not been shown to adversely affect cell-mediated immunity (6,8,9).

"Pantothenic acid" is derived from the Greek word meaning "from everywhere," and aptly describes the presence of pantothenic acid in foods. Relatively high levels are found in chicken, beans, potatoes, oat cereals, tomato products and whole grains (13); however, it is acid, alkali and heat labile (4) and processing can decrease the amount of pantothenic acid in foods (14). Individuals likely to be at risk for pantothenate deficiency are those in nutritional high risk groups. Adolescence is characterized by major physiological changes and unusual, often irregular eating habits.

Adolescent diets are frequently low in iron, calcium, zinc, and vitamins A, B_6, C and folacin (15-18). In the developed nations overt signs of vitamin and mineral deficiency are virtually nonexistent, except perhaps iron deficiency which is observed occasionally in 13-18 year old girls (15,19,20). The commonest nutritional disorder observed in adolescence is obesity. However, obesity has been attributed more to decreased activity levels than to increased food consumption. Another related nutritional concern in adolescents, is dieting practices. Adolescent dieters tend to skip meals more frequently and often diet unnecessarily (21). The extremes of this

common negative body image have lead to increasing cases of anorexia nervosa and bulimia in adolescent girls.

Very little information has been collected on the nutritional needs of adolescents. During adolescence nutritional needs are elevated for some nutrients but begin to resemble adult values for other nutrients (15). Substantial information exists for energy and water (1). Some incomplete data are available for protein, calcium, magnesium, iron, zinc, flouride, iodide, vitamin D, thiamin, riboflavin and ascorbic acid. All other recommendations are based on interpolations from studies of adults or children and can only be regarded as educated guesses (15).

Food habits of adolescents are influenced by a number of unique physiological, social and psychological factors. Adolescents frequently skip meals and consume fast foods, high quantities of soft drinks, and on the average, increasing amounts of alcohol (16). Although snacks can be nutritionally balanced they frequently are highly processed and have a low nutrient density. Consequently, in the diet of modern adolescents pantothenic acid may not be as universally available as the name implies.

Previous studies of children and adolescents show pantothenic acid intake is frequently below the suggested level. Using a microbiological assay, Pace et al. studied pantothenic acid intake for 7 to 9 year old girls during three study periods (22). Pantothenic acid intakes varied from averages of 2.79 mg to 5.00 mg. Kerrey et al. (23) measured dietary intake in preschool children ages 3.5 to 5.5 years, in high and low income groups. Dietary intakes averaged 3.9

and 5.0 mg/day for the high and low income children respectively. Dietary intakes were based on the works of Zook et al. (24) where many of the pantothenic acid values are for raw products rather than for products as consumed. Kathman and Kies (25) determined pantothenic acid levels from a four-day dietary intake in a population of eleven adolescents ages 10-16 years. Dietary intakes were based on Orr (26) and averaged 5.5 mg/day.

Pace et al. (22) also determined urinary pantothenic acid excretion during three study periods and found excretion varied from averages of 1.30 to 2.85 mg/day. Schmidt (27) measured urinary excretion in a group of children (ages 1 to 14 years) and an adolescent to adult group (ages 16 to 45 years) and found values of 2.5 mg/day and 2.7 mg/day respectively. Kerrey et al. (23) also measured urinary excretion in preschool children. Pantothenic acid excretion averaged 3.5 and 2.0 mg/day for the high and low income children respectively. Kathman and Kies (25) in their study of adolescents, found urinary excretion of pantothenic acid averaged 3.74 mg/g creatinine.

Blood levels of pantothenic acid have been determined in whole blood and serum. Baker et al. (28) analyzed pantothenate in blood samples of 642 school children ages 10-13 yrs. and found mean pantothenic acid levels to be 290 ng/ml. In the adolescent population studied by Kathman and Kies (25), blood serum pantothenic acid levels averaged 261 ng/ml.

Presently there is a dearth of information on the pantothenic acid status of adolescents. The study by Kathman and Kies (25) is

based on a population of 11 adolescents. Although Schmidt's study (27) included adolescents they were not distinguished from the adult population. The general objective of this study was to provide a comprehensive examination of pantothenic acid in an adolescent population, including analysis of dietary intake, urinary excretion and blood levels. Specific objectives of this study were: 1) To assess the level and range of variability of pantothenic acid in a free-living, healthy, adolescent population as determined by dietary intake, blood levels and urinary excretion; 2) To determine if dietary intakes of pantothenic acid correlated with levels measured in whole blood, erythrocytes and/or urine samples; 3) To develop a model whereby circulating levels of pantothenic acid could be predicted from dietary intake and urinary excretion; and 4) To determine how well the level of dietary pantothenic acid measured in this population corresponds to the recommendation of the Food and Nutrition Board.

METHODS

Subjects

Sixty-three adolescents were randomly recruited from the student body of a local high school. Participants were selected based on age; females 13-17 years, males 14-19 years. Subjects also completed a demographic questionnaire which included questions on overall health (Appendix A). No participant was accepted who reported a chronic health problem. Informed consent was obtained from subjects and their parents (Appendix B). Instruction on measuring and recording dietary intake and collecting urine and blood samples were given at subsequent

group meetings the day prior to beginning the four-day study (Appendix C). The research protocol was approved by the Human Research Committee of Utah State University (Appendix D).

Estimation of Nutrient Intake

Participants recorded a complete dietary intake for the four-day period after detailed instruction on how to keep a quantitative dietary record. At the end of the four day period the completed dietary records were reviewed by the researcher with the subjects to clarify parts of the record if necessary. Daily intakes of pantothenic acid and other nutrients were estimated using the NUTREDFO computer data base developed at Utah State University in conjunction with a contract from USDA's Human Nutrition Information and Dietary Guidance Staff. Multi-vitamin supplements taken by a few individuals were added to their dietary intakes. The NUTREDFO data base is composed of a file containing 27 nutrient values for approximately 500 foods (29). Major sources for pantothenic acid composition in foods were the Revised Agriculture Handbook 8 (30) the Home Economic Research Report No. 36 (26), the McCance and Widdowson's Food Composition (31) and other published research reports (13,24,32). Nutrient composition for mixed food items was determined from ingredient lists. Foods consumed which were not listed in the data base were estimated based on values for comparable foods.

Sample Collection

During the last two days of the dietary record subjects were asked to collect pooled urine samples. Two 3L containers were provided for each subject which contained 5 mls of the antimicrobial agent thimerosol (1:100 dilution). The daily pooled urine sample was chosen for this age group to eliminate potential error from incomplete 24 hr. collections. Participants were asked to collect as many voidings during the day as possible with a minimum of 500 mls and were instructed to refrigerate or freeze the samples until they could be delivered to the lab for analysis.

The morning following completion of the four-day dietary and two-day urine collection, height, weight and a fasting blood sample were taken from each participant. The 10 ml blood sample was drawn by venipuncture into a heparinized vacuum tube by a registered medical technologist at the Student Health Center. Hematocrits were determined on fresh blood samples. One alliquot was reserved for whole blood analysis while a second alliquot was centrifuged. Plasma was removed and the erythrocytes resuspended in an isotonic NaCl solution (.15 N). Samples were hemolyzed by three quick freeze-thaw cycles.

Chemical Analysis

Total pantothenate levels were determined in urine, whole blood and erythrocyte samples by radioimmunoassay (RIA) (33). Urine samples were thawed, centrifuged (4000 x g, 10 min), and diluted 1:20 with distilled water. Urinary creatinine was quantitated by the alkaline picrate method (34).

Hemolyzed blood samples were subjected to a double enzyme treatment with 5 U of bovine intestinal-alkaline phosphatase (1 U phosphatase hydrolyzes 1.0 umol of p-nitrophenyl phosphate per min at pH 10.4 and 37°C) and 0.1 U of pantetheinase (1 U pantetheinase hydrolyzes 1.0 umol of pantetheine per min) which had been purified and activity determined by mercaptide assay according to Wittwer et al. (35). The enzymes were added to 0.4 ml of 0.1 M Tris (hydroxymethyl) aminomethane buffer (pH 8.1) and the volume adjusted to 1 ml with distilled water. After 7 to 8 h of incubation at 37°C in a shaker bath, saturated $Ba(OH)_2$ and equimolar 10% $ZnSO_4$ were added and the suspension centrifuged at 4000 x g for 10 min. The clear supernatant was analyzed for pantothenate by RIA (33). Pantothenic acid content was calculated as ng/ml whole blood and ng/ml erythrocytes in saline.

Data Analysis

The range and variability of pantothenic acid intakes were determined by means and standard deviations for the population broken down by sex. Pearson's correlation coefficients were calculated to determine if dietary intake correlated with whole blood, erythrocytes, or urinary pantothenate. Regression analysis was used to develop a model which could predict circulating levels of pantothenic acid from dietary intake and urinary excretion. A significance level of .001 was used throughout the study.

RESULTS

A complete list of subject characteristics and pantothenic acid values for dietary intake, urinary excretion, whole blood and erythrocyte concentrations is located in Appendix E. Appendix F contains the averages of nutrients consumed during the four-day study period for each subject as computed by the NUTREDFO data base. Means of age, height and weight for male and female subjects are summarized in Table 1.

Dietary intake of pantothenic acid ranged from 1.7 mg/day to 12.7 mg/day. The average intake of females (4.14 ± 1.21 mg/day) was significantly lower than that of male adolescents (6.25 ± 2.07 mg/day). However, in terms of nutrient density (females 2.17 ± .39 mg PA/1000 kcals, males 2.34 ± .42 mg PA/1000 kcals) there was no significant difference between the sexes. Table 2 summarizes the dietary intake of pantothenic acid and levels in biological fluids for the unsupplemented adolescent population. Six individuals, five females and one male, took a dietary supplement containing at least 5 mg of pantothenic acid daily. The impact of these supplemented females raised the average dietary pantothenic acid level by more than 1 mg per day. However of the five females consuming supplements only one individual consumed less than 2 mg/1000 kcal from diet alone, the remainder consumed 2.5 mg/1000 kcals or more.

Values determined by RIA for biological fluids included whole blood, erythrocytes and urine. Means and standard deviations for both sexes are listed in Table 2. There were no significant differences

Table 1. Demographic variables of study subjects.

Variables	Females	Males
	n=37	n=26
Age (year)	15.2 ± 1.3*	16.1 ± 1.7
Height (cm)	163.6 ± 5.9	173.6 ± 10.8
Weight (kg)	54.0 ± 9.4	60.3 ± 12.9

*Mean ± SD.

Table 2. Mean pantothenic acid content in diet and biological fluids of the unsupplemented population.

Variables	Pantothenic acid content		
	Females n=32	Males n=25	Total n=57
Dietary intake (mg/day)	4.14 ± 1.21*	6.25 ± 2.07†	5.06 ± 1.94
Nutrient density (mg/1000 kcals)	2.17 ± 0.39	2.34 ± 0.42	2.25 ± 0.41
Whole blood (ng/ml)	344.50 ± 113.60	411.90 ± 102.80	374.0 ± 113.20
Erythrocytes (ng/ml)	301.38 ± 93.46	375.62 ± 104.33	333.94 ± 104.31
Urine (mg/g creatinine)	4.49 ± 1.87	3.32 ± 1.33	3.98 ± 1.75

*Mean ± SD
†Significantly higher than that of females

between the sexes. Hematocrit values were all within normal ranges for this population (males 47% ± 5, females 42% ± 5).

Pearson's correlations indicated that diet was significantly correlated ($p < 0.001$) with whole blood ($r = .38$), erythrocytes ($r = .38$) and urinary excretion ($r = .60$) (Table 3). Urinary excretion of pantothenic acid was not significantly correlated with circulating levels of pantothenic acid as measured in whole blood and erythrocytes in saline solution.

DISCUSSION

Despite the presence of pantothenic acid in most foods, adequate consumption of the vitamin is not easily obtained for a large percentage of the adolescent population because of their food choices. Based on actual food consumption, 49% of the females and 15% of the males fell below the minimum suggested safe and adequate level set by the Food and Nutrition Board of 4 mg/day. In terms of nutrient density, a level of 2 mg pantothenic acid/1000 kcals would achieve the minimum of 4 mg/day for the needs of an average female consuming 2,000 kcal. In this population, 38% of the females and 27% of the males were consuming less than 2 mg pantothenic acid/1000 kcals. Since the average caloric intake for females was 1900 ± 400 kcals many are at risk for inadequate pantothenic acid intake. The higher average caloric consumption of males 2700 ± 740 may allow them more leniency on their food choices in order to achieve the suggested safe and adequate level. However during the adolescent period when nutrients are required for growth as well as activity and maintenance, needs in

Table 3. Pearson's correlation coefficients between erythrocyte and whole blood pantothenic acid content (ng/ml), urinary pantothenic acid excretion (mg/g creatinine), and dietary pantothenic acid intake (mg/day).

	Erythrocyte Pantothenic Acid ng/ml	Whole Blood Pantothenic Acid ng/ml	Urinary Pantothenic Acid mg/g creatinine	Pantothenic Acid Intake mg/day
Erythrocyte PA (ng/ml)	1.00			
Whole blood PA (ng/ml)	0.85*	1.00		
Urinary PA (mg/g creatinine)	-0.08	-0.02	1.00	
Pantothenic acid intake (mg/day)	0.38*	0.38*	0.60*	1.00

*Significant at $p < .001$

terms of nutrient density may be very similar, thus eliminating any leniency allowed those consuming higher caloric levels. Dietary pantothenic acid intake of this population is similar to that observed by other researchers examining this age group (25,36).

Considerable methodological variation existed between studies using free and total pantothenic acid in serum or whole blood and in the enzymatic treatment to free pantothenic acid from the larger coenzyme molecules. An avian liver extract is commonly used to free the vitamin from its bound form and contains high levels of endogenous pantothenic acid. Recent development of independent assays for pantotheine hydrolysis and purification techniques have improved enzymatic liberation of pantothenate from 'bound' forms (35,37). Results of the RIA are highly correlated with those of the microbiological assay in blood (33,38), urine (38) and in food (13,39). Levels of pantothenic acid in whole blood determined in this population (381 ± 118 ng/ml) are also similar to those determined by other researchers (23,25). Controversy remains however, on the adequacy level of the vitamin in whole blood (40) due to the wide variation recorded in the literature.

Blood serum is known to contain only free pantothenic acid in small amounts (33). Eythrocytes, however, contain primarily bound forms of the vitamin in the form of coenzyme A or other forms (40-42). Serum levels have been poorly correlated with whole blood pantothenic acid and may be a poor indicator of pantothenic acid status (43). Therefore, we chose to examine pantothenic acid levels in whole blood and erythrocytes rather than serum. Pantothenic acid values

determined for erythrocytes were highly correlated ($r = .85$, $p < .001$) to that in whole blood. Consequently whole blood and erythrocytes had similar correlations to urinary excretion and dietary intake.

It would be useful to predict circulating levels of pantothenic acid from easily measured values such as dietary intake and urinary excretion. Positive correlations between dietary intake and circulating blood levels have been shown in this study and by other researchers (38,43). Urinary excretion of pantothenic acid has also been shown to be positiviely correlated with diet in this study and others (38,43,44,45). Urinary excretion of pantothenic acid was not significantly correlated with levels in whole blood or erythrocytes. A model was developed based on the factors dietary intake, urinary excretion and metabolic needs (Figure 1). The amount of pantothenic acid required by an individual for metabolic processes is poorly understood. The role of pantothenic acid in the body centers primarily on two important cofactors; coenzyme A and phosphopantetheine in which pantothenic acid is the vitamin moiety. These cofactors are involved in over 70 enzymatic reactions (31). Less than 100% efficiency necessitates obligatory losses of pantothenic acid, termed 'metabolic needs' for this pantothenic acid budget. This study did not attempt to determine metabolic needs of individuals, however one would anticipate considerable variation based on subjective evaluations of participants activity levels and growth phases.

Both whole blood and erythrocyte pantothenic acid levels had significant positive correlations in the regression model developed (r

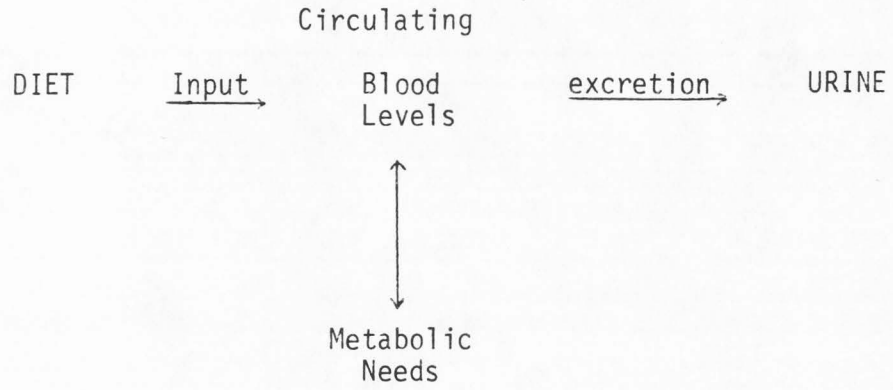

Figure 1. Flow model to predict circulating levels of pantothenic acid in erythrocytes from dietary intake (DIET) and urinary excretion (URINE).

= .50 and r = .54) however the correlation was slightly higher using pantothenic acid levels in erythrocytes. We recognize that in the model urinary excretion expressed as mg/day would be preferable for comparisons to dietary intake. This measure was not used in this study due to the difficulty of obtaining complete 24 h samples from this population. Attempts to express dietary intake by nutrient density or use of height and weight as an estimate of body mass and caloric needs did not contribute to the model. This result is expected in a population undergoing rapid physiological changes. Segregation by gender slightly improved the model, but was due to differences in caloric intake between males and females. The relatively low R^2 value for the model may be attributed to our inability to address metabolic needs and the inherent error associated with reported dietary intake in a free living population. However, the NUTREDFO data base is probably the most complete data base available for studies of this kind.

A least squares line drawn through the points in Figure 2 reveal the slope of the line is greater than expected. Actual erythrocyte levels of pantothenic acid are higher than that predicted by the model possibly indicating that as erythrocyte levels increase with increased dietary intake relative urinary excretion is declining leading to increased pantothenic acid storage. Use of erythrocytes for predicting pantothenic acid levels may have eliminated some variation contributed by serum in whole blood. Further development of models for circulating levels of pantothenic acid may also be useful in the future as a simple indicator of pantothenic acid status, especially

Predicted Erythrocyte Pantothenic Acid* = 322.0 + 18.4 (DIET*) - 21.0 (URINE*)

$R^2 = 0.30$

*Significant at p 0.001

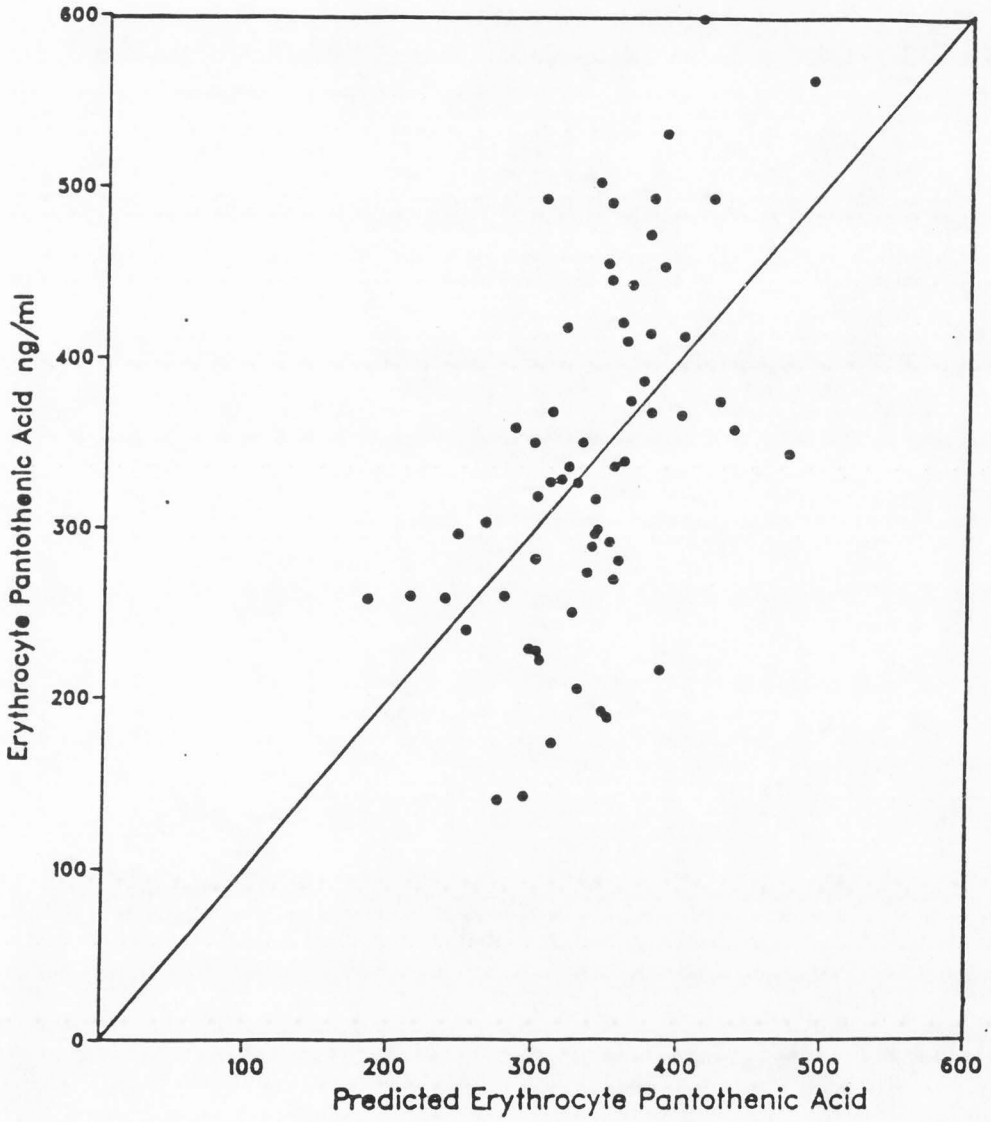

Figure 2. Relationship of predicted to observed erythrocyte pantothenic acid using DIET and URINE as independent variables.

when developed for more homogeneous populations where growth and activity level can be better controlled.

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APPENDICES

Appendix A: Questionnaire

Subject code _____

Participant Questionaire

Name _____ Date _____

Address _____ Sex _____

Phone _____ Age (to nearest year) _____

Height _____ Weight _____

How would you asses your overall health?

___ Excellent ___ Good ___ Fair ____ Poor

Have you taken medication for any illness during the last month? _____

Do you take any prescription drugs regularly? _____

Have you had any chronic medical problems (For example: diabetes, anemia, heart disease, any problems that last a long time) ? _____

If so, please explain briefly. _____

_____

Do you take any vitamin or nutritional supplements? _____

If so, how often do you take them? _____

What kind of supplement are you taking? _____

Appendix B: Informed Consent Form

INFORMED CONSENT FORM

Pantothenic Acid Status of Adolescents

Principle Investigators: Drs. Bonita Wyse and R. Gaurth Hansen

Student Researcher: Brenda Eissenstat

This project is seeking to determine levels of pantothenic acid in groups th ought to be at increased nutritional risk. The adolescent population is of interest because of rapid physiological changes which occur during this time period as well as unusual and oftentimes irregular eating habits. Participation in this study will contribute significantly to the knowledge of pantothenic acid in the adolescent population.

Participants will be asked to maintain a complete dietary record for four days, will be asked to collect urine samples for two days and will complete a short questionaire to asses overall health. All information regarding subjects will be kept confidential. A small blood sample (approx. one tablespoon) will be drawn from a vein in the arm. This may result in some discomfort or possible bruise. However, experience has shown these problems can be significantly reduced when a trained medical technologist is involved. Sterile and standard procedure will be followed.

Subjects have the opportunity to withdraw consent and terminate participation in the activity at any time. Any inquiries concerning the project procedures can be answered anytime by Brenda Eissenstat or Drs. Bonita Wyse and Gaurth Hansen.

_____ _____

Participant, Signature and Date

Parent or Guardian, Signature and Date
(If participant is under age 18)

Phone number _____

I will probably attend the meeting on : July 18 at 10 AM _____
July 18 at 6 PM _____

July 25 at 10 AM _____
July 25 at 6 PM _____

If none of these times are convenient for you please check here and we will try to arrange a suitable time.

_____

Appendix C: Instructions to Participants

Instructions for keeping diet record

1. List the foods you eat for four consecutive days.
2. Record EVERYTHING you eat or drink in each 24-hour period. Remember to write down such items as coffee, tea, cream, sugar, juice, milk, butter, margarine, jelly, gravy, mayonnaise, ketsup, mustard, pickles, soft drinks, etc.
3. Describe how the food was prepared and eaten (e.g., boiled, fried, or baked) and give a brand name when possible.
4. Record the amount of each food and beverage in terms of units such as cup(s), ounce(s), Tablespoons(s), teaspoon(s) or slice(s).
5. Record the approximate time of day the food was eaten.
6. Keep yourfood record form at home and fill it in every day. You may want to write down what you eat during the day on a separate paper while you are away from home and then transfer it to the record that night.

EXAMPLE

Diet Record Form

Approx. Time	Item eaten	How prepared	Amount	Food code	Weight
8 AM	Whole Wheat Toast		1 slice		
	Margarine		1 tsp.		
	Strawberry Jam		2 tsp.		
	Eggs	Fried	2 large		
	Orange Juice (unsweetened)		1 cup		
11 AM	Snickers candy bar		3 oz		
2 pm	Hamburger:				
	beef	fried	4 oz		
	American cheese		1/2 oz		
	lettuce		small leaf		
	dill pickle chips		2 slices		
	mustard		1tsp		
	bun		1 large		
	French fries	fried	20		
8pm	McDonald's Shake		1 large		

Instructions for Collecting Urine Samples

Urine samples must be collected for two of the four days during the study period. If possible collect all voidings on those days.

The white pans provided will fit most toilet bowls and may be the easiest way to collect your samples. After voiding save your sample in the brown sample containers. Save all the samples from one day in the same container. These brown sample bags contain a small amount of an anti-microbiol agent, however your sample will start to degrade after 24 hrs. unless it is kept cool.

You can store your samples in a refrigerator, ice chest with ice, or freezer.

Bring your two sample containers with you when you come in on the last day.

Preparations for Collecting Blood Sample & Final Meeting

On the 4th day of the diet record do not eat any food after midnight until your blood sample is collected the next morning. This is called a fasted blood sample. Chemicals from the food you eat can change the levels of pantothenic acid and other compounds in your bloodstream for several hours. However, by not eating for 7-8 hrs. levels of chemicals in the blood will stay fairly constant and will give a more accurate measure of the pantothenic acid in your blood.

On the morning your blood sample is to be taken come to the Utah State University Student Health Center located just inside the west entrance of the Taggart Student Center on the main floor. Metered parking is available on 8 east in the 500-600 north block.

A medical technologist will be available to take samples from 7-9 a.m.

At that time I will quickly go over your diet records with you, take your brown sample bags and give you your ten dollars.

This final meeting will probably take 15-30 minutes.

When the analysis of your samples and diet are complete I will send you a computer analysis of your diet, measurements of your hematocrit (or red blood cell level) and pantothenic acid levels in your blood and urine as well as the range of values for the group.

Your cooperation is appreciated very much and I hope you will enjoy participating in the project and learning more about your body and the food you eat.

Appendix D: Research Protocol

Statement of the PI to the IRB for Proposed Research Involving Human Subjects

Proposal Title Pantothenic Acid Status of Adolescents

Principal Investigator* Dr. B.W. Wyse, Dr. R. G. Hansen Dept. NFS Ext. 2123

Student Researcher Brenda R. Eissenstat Dept. NFS Ext. 2117

A. Human subjects will participate in this research and be asked to do the following: Provide one blood sample (7ml), Maintain a dietary record for four consecutive days, Collect a pooled urine sample for two days.

B. The potential benefits to be gained from the proposed research are:

This study will give data on which the recommended dietary allowance (RDA) of pantothenic acid for the adolescent population can be based. The group's intake of nutrients other than pantothenic acid will also be evaluated.

C. The risk(s) to the rights and welfare of human subjects involved are:

A venipuncture of subjects may result in discomfort, hematoma and a possibility of infection. Collection of the urine sample and dietary record should not pose any risk to the subjects.

D. The following safeguards/measures to mitigate/minimize the identified risks will be taken: A trained registered medical technologist will be hired to draw blood samples and will follow sterile and standard procedures.

E. The informed consent procedures for subjects will be as follows: (Explain procedures to be followed and attach an example of the informed consent instrument) Candidates will be contacted by mail and informed of the purpose, involvement and benefits of the study and will be asked for volunatry cooperation. A written consent form will be signed by each participant & parent or guardian if participant is a minor.

F. The following measures regarding confidentiality of subjects will be taken: All questionaires and samples will be collected and kept by the principal investigator. After first interview, a numbering system will replace the subject's name.

G. Other: (If, in your opinion no, or minimal, risk to subjects exists, please explain in this section) Questionaire to asses overall health of volunteers.

Brenda R. Eissenstat

Principal Investigator Signature* Student Researcher Signature

*A student researcher should name his/her advisor or chairman as the principal investigator. Both are required to sign this form.

Appendix E. Subject Information and Pantothenic Acid Values

Column	Description
ID #	Subject identification number
Sex	1 = female, 2 = male
ht	Height (cm)
wt	Weight (kg)
wb	Whole blood pantothenic acid (ng/ml)
eryth	Erythrocyte pantothenic acid (ng/ml)
hemat	Hematocrit (%)
kcal	Kilocalories - daily average
supp	Supplement code: 1 = never 2 = occasional 3 = weekly 4 = daily without pantothenic acid 5 = daily with pantothenic acid
age	Years
diet	Averaged dietary intake of pantothenic acid
urine	Urinary pantothenic acid (mg/g creatinine)

Subject Information and Pantothenic Acid Values

ID#	sex	ht	wt	wb	eryth	hemat	kcal	supp	age	diet	urine
001	2	180	069	239.4	215.5	49	3166	1	16	05.76	01.97
003	2	165	052	326.0	298.0	45	2345	1	14	04.46	02.90
004	1	165	053	249.0	249.3	42	1590	1	15	03.80	03.15
005	1	168	053	155.8	142.0	44	1575	1	14	04.42	05.27
006	1	170	084	298.9	239.4	44	1310	3	16	03.31	06.20
008	1	157	048	279.5	295.5	44	0942	4	17	01.69	05.08
010	1	155	040	358.8	326.0	45	2200	2	15	05.81	05.68
011	1	152	036	244.7	258.0	44	2238	1	14	03.87	07.39
012	1	163	052	341.9	221.4	42	1346	4	16	03.18	03.69
013	1	165	049	259.2	259.2	45	1649	1	16	03.13	07.89
014	2	170	059	553.3	595.8	49	4426	4	16	12.65	06.74
015	1	177	067	393.7	441.5	46	2460	1	17	04.80	02.10
016	1	163	051	421.2	327.6	46	2674	1	14	04.83	04.45
017	1	160	051	349.2	288.0	43	2573	2	16	06.57	04.93
018	1	163	060	362.0	338.0	45	2375	1	14	07.05	04.31
019	2	162	055	553.0	444.3	45	1911	1	16	05.59	03.47
020	1	155	059	239.4	272.6	41	1234	1	17	03.17	02.11
021	1	164	049	276.6	191.5	49	2101	4	17	03.39	01.79
022	1	165	053	508.3	416.7	45	2027	2	17	04.50	04.02
023	2	188	077	351.0	335.0	47	2083	1	15	03.55	01.55
024	2	184	064	563.3	491.3	52	2868	1	18	08.79	02.96
026	1	157	054	325.5	325.5	45	1835	1	13	03.26	02.53
027	1	162	056	331.2	302.4	45	1455	1	15	02.43	04.83
028	2	182	066	393.0	365.0	52	2825	1	18	06.91	02.32
029	1	161	061	345.6	259.2	46	1305	1	15	03.12	04.81
030	1	165	122	758.0	559.7	47	1037	5	16	21.31	10.65
031	1	165	045	481.7	501.3	45	2007	3	15	05.64	03.93
032	1	169	050	356.4	342.1	42	2084	5	13	16.04	06.75
033	1	160	056	430.3	317.7	45	1527	1	16	02.97	03.62
034	1	154	058	404.5	373.5	46	1706	5	17	08.91	05.74
035	1	156	046	428.3	367.3	42	2109	1	14	04.13	04.16
036	1	160	050	408.5	411.0	44	2099	5	13	09.00	04.08
037	1	160	054	505.0	349.2	45	1628	2	15	03.41	04.12
038	1	165	044	554.4	349.2	45	1973	4	16	05.12	04.00
041	2	178	059	467.6	454.0	50	2825	2	16	04.71	02.82
042	2	175	064	425.8	385.2	49	3915	1	15	07.64	04.20
044	2	178	056	433.7	413.0	51	2524	1	15	06.14	02.69
045	2	165	052	477.5	452.0	52	1991	1	19	05.54	01.70
046	2	175	067	320.2	268.6	48	3105	3	18	08.63	06.01
047	1	170	066	360.0	226.8	41	2096	1	16	03.60	04.16
048	1	163	065	332.8	316.0	42	1604	1	15	03.00	01.70
049	2	178	059	539.0	529.0	51	2318	1	17	06.15	02.19

050	1	170	048	242.9	228.1	41	1884	2	15	04.13	04.88
051	1	170	055	382.7	334.9	45	1282	5	16	12.75	11.14
052	1	170	070	532.0	491.8	44	2327	1	17	05.86	02.34
053	2	150	039	532.7	358.0	45	1591	1	15	03.48	04.82
054	2	154	047	264.7	279.7	48	2570	3	14	06.64	04.11
056	2	168	053	404.0	489.3	47	2010	1	15	05.78	03.66
057	2	168	057	549.3	470.7	49	2688	4	14	05.98	02.56
058	2	183	065	251.7	187.8	52	2427	1	19	04.47	02.54
059	1	170	069	560.5	491.7	41	2057	1	15	03.25	03.64
060	2	163	049	361.7	204.5	45	1973	1	14	04.75	03.79
069	2	182	060	427.5	373.0	46	3862	4	15	08.52	02.47
070	1	165	050	173.0	172.9	42	2223	4	14	04.86	04.73
073	2	188	053	360.7	290.7	52	2840	1	17	07.88	05.49
074	1	176	049	291.6	280.8	43	2400	1	15	04.81	05.28
075	1	168	051	132.5	139.9	40	2101	1	13	04.46	06.15
076	2	173	069	312.8	419.5	51	2177	1	18	05.03	02.62
077	1	160	043	257.6	257.6	43	2319	1	13	04.86	10.80
081	2	193	109	291.6	295.3	49	1567	4	16	03.32	02.00
084	2	175	059	388.9	356.4	47	1634	5	15	21.40	13.28
087	2	160	047	405.3	408.5	42	2971	1	15	06.20	03.49
091	2	175	062	491.4	366.7	47	3722	4	21	07.60	03.92

Appendix F. Averaged Nutrient Values for Subject Diets

List of Abbreviations

KCALS	Kilocalories
PROT	Protein
FAT	Fat
T SAT	total saturated fats
T POLY	total polyunsaturated fats
T MONO	total monounsaturated fats
CHOL	Cholesterol
CARB	Carbohydrates
+SUGAR	Added sugar
ALCOH	Alcohol
CALC	Calcium
IRON	Iron
MAGN	Magnesium
PHOS	Phosphorus
ZINC	Zinc
POTAS	Potassium
SODIUM	Sodium
VIT A	Vitamin A
THIA	Thiamin
RIBO	Riboflavin
PRENIA	Pre-niacin
VIT B6	Vitamin B_6
VIT B12	Vitamin B_{12}
A ACID	Ascorbic Acid
FOLA	Folacin
PACID	Pantothenic Acid

031

AVERAGES OVER DAYS													
KCALS	2007.	PROT	78.7gm	FAT	53.7gm	TSAT	22.7gm	TPOLY	7.3gm	TMONO	20.2gm	CHOL	192.mg
CARB	305.7gm	+SUGAR	122.3gm	ALCOH	0.0gm	CALC	1508.mg	IRON	18.4mg	MAGN	280.mg	PHOS	1598.mg
ZINC	16.76mg	POTAS	2827.mg	SODIUM	2388.mg	VITA	5998.iu	THIA	2.20mg	RIBO	3.34mg	PRENIA	26.6mg
VITB6	2.34mg	VITB12	5.27ug	AACID	178.mg	FOLA	334.ug	PACID	5.64mg				

033

AVERAGES OVER DAYS													
KCALS	1527.	PROT	47.9gm	FAT	50.6gm	TSAT	19.4gm	TPOLY	8.7gm	TMONO	18.5gm	CHOL	159.mg
CARB	223.8gm	+SUGAR	112.4gm	ALCOH	0.0gm	CALC	610.mg	IRON	10.8mg	MAGN	175.mg	PHOS	816.mg
ZINC	5.94mg	POTAS	1428.mg	SODIUM	1739.mg	VITA	2084.iu	THIA	0.84mg	RIBO	1.23mg	PRENIA	12.6mg
VITB6	1.00mg	VITB12	2.88ug	AACID	104.mg	FOLA	87.ug	PACID	2.97mg				

035

AVERAGES OVER DAYS													
KCALS	2109.	PROT	70.9gm	FAT	86.3gm	TSAT	24.2gm	TPOLY	23.4gm	TMONO	34.5gm	CHOL	231.mg
CARB	260.5gm	+SUGAR	103.4gm	ALCOH	0.0gm	CALC	765.mg	IRON	10.6mg	MAGN	169.mg	PHOS	1065.mg
ZINC	8.45mg	POTAS	2661.mg	SODIUM	1913.mg	VITA	3086.iu	THIA	1.26mg	RIBO	1.60mg	PRENIA	19.7mg
VITB6	1.05mg	VITB12	2.75ug	AACID	63.mg	FOLA	120.ug	PACID	4.13mg				

091

AVERAGES OVER DAYS													
KCALS	3722.	PROT	114.0gm	FAT	123.6gm	TSAT	36.9gm	TPOLY	31.1gm	TMONO	46.0gm	CHOL	649.mg
CARB	445.1gm	+SUGAR	137.1gm	ALCOH	60.8gm	CALC	797.mg	IRON	32.4mg	MAGN	520.mg	PHOS	1668.mg
ZINC	15.41mg	POTAS	4467.mg	SODIUM	3861.mg	VITA	10575.iu	THIA	3.28mg	RIBO	3.47mg	PRENIA	57.7mg
VITB6	5.14mg	VITB12	9.47ug	AACID	239.mg	FOLA	548.ug	PACID	7.30mg				

081

AVERAGES OVER DAYS													
KCALS	1567.	PROT	58.7gm	FAT	70.4gm	TSAT	29.8gm	TPOLY	7.1gm	TMONO	28.8gm	CHOL	231.mg
CARB	176.6gm	+SUGAR	42.8gm	ALCOH	0.0gm	CALC	637.mg	IRON	11.5mg	MAGN	180.mg	PHOS	929.mg
ZINC	11.31mg	POTAS	1900.mg	SODIUM	2408.mg	VITA	2387.iu	THIA	1.24mg	RIBO	1.35mg	PRENIA	14.5mg
VITB6	1.31mg	VITB12	3.21ug	AACID	177.mg	FOLA	190.ug	PACID	3.32mg				

057
AVERAGES OVER DAYS

KCALS	2688.	PROT	79.3gm	FAT	94.7gm	TSAT	40.9gm	TPOLY	14.0gm	TMONO	33.3gm	CHOL	324.mg
CARB	391.8gm	+SUGAR	151.2gm	ALCOH	0.0gm	CALC	1334.mg	IRON	53.6mg	MAGN	365.mg	PHOS	1674.mg
ZINC	10.89mg	POTAS	3159.mg	SODIUM	3489.mg	VITA	16158.iu	THIA	4.73mg	RIBO	5.95mg	PRENIA	58.8mg
VITB6	5.61mg	VITB12	17.87ug	AACID	294.mg	FOLA	883.ug	PACID	5.98mg				

069
AVERAGES OVER DAYS

KCALS	3862.	PROT	129.3gm	FAT	156.5gm	TSAT	46.7gm	TPOLY	43.6gm	TMONO	55.9gm	CHOL	496.mg
CARB	477.9gm	+SUGAR	149.5gm	ALCOH	0.0gm	CALC	1399.mg	IRON	21.2mg	MAGN	405.mg	PHOS	2162.mg
ZINC	17.35mg	POTAS	5333.mg	SODIUM	5027.mg	VITA	5663.iu	THIA	2.37mg	RIBO	3.12mg	PRENIA	35.6mg
VITB6	2.47mg	VITB12	6.95ug	AACID	251.mg	FOLA	474.ug	PACID	8.52mg				

070
AVERAGES OVER DAYS

KCALS	2223.	PROT	66.6gm	FAT	67.9gm	TSAT	24.6gm	TPOLY	11.7gm	TMONO	27.1gm	CHOL	167.mg
CARB	342.8gm	+SUGAR	158.1gm	ALCOH	0.0gm	CALC	1223.mg	IRON	23.0mg	MAGN	307.mg	PHOS	1466.mg
ZINC	8.31mg	POTAS	2205.mg	SODIUM	2896.mg	VITA	8898.iu	THIA	2.31mg	RIBO	3.03mg	PRENIA	26.3mg
VITB6	2.45mg	VITB12	6.20ug	AACID	143.mg	FOLA	400.ug	PACID	4.86mg				

036
AVERAGES OVER DAYS

KCALS	2099.	PROT	59.5gm	FAT	80.6gm	TSAT	34.5gm	TPOLY	11.4gm	TMONO	30.1gm	CHOL	262.mg
CARB	288.8gm	+SUGAR	105.2gm	ALCOH	0.0gm	CALC	850.mg	IRON	14.6mg	MAGN	192.mg	PHOS	1148.mg
ZINC	11.87mg	POTAS	2563.mg	SODIUM	2036.mg	VITA	2720.iu	THIA	1.41mg	RIBO	1.95mg	PRENIA	17.2mg
VITB6	1.28mg	VITB12	3.30ug	AACID	93.mg	FOLA	236.ug	PACID	4.00mg				

047
AVERAGES OVER DAYS

KCALS	2096.	PROT	52.9gm	FAT	73.5gm	TSAT	26.5gm	TPOLY	15.3gm	TMONO	27.4gm	CHOL	191.mg
CARB	304.2gm	+SUGAR	151.2gm	ALCOH	0.0gm	CALC	861.mg	IRON	9.6mg	MAGN	199.mg	PHOS	1063.mg
ZINC	7.13mg	POTAS	1749.mg	SODIUM	4244.mg	VITA	3458.iu	THIA	1.36mg	RIBO	1.66mg	PRENIA	15.4mg
VITB6	1.45mg	VITB12	2.04ug	AACID	84.mg	FOLA	197.ug	PACID	3.19mg				

016
AVERAGES OVER DAYS

KCALS	2674.	PROT	67.3gm	FAT	85.6gm	TSAT	34.6gm	TPOLY	16.5gm	TMONO	30.3gm	CHOL	265.mg
CARB	413.2gm	+SUGAR	246.5gm	ALCOH	0.0gm	CALC	1397.mg	IRON	15.6mg	MAGN	230.mg	PHOS	1510.mg
ZINC	12.15mg	POTAS	2368.mg	SODIUM	2385.mg	VITA	4415.iu	THIA	1.63mg	RIBO	2.55mg	PRENIA	15.6mg
VITB6	1.53mg	VITB12	4.58ug	AACID	65.mg	FOLA	229.ug	PACID	4.83mg				

060

AVERAGES OVER DAYS

KCALS	3005.	PROT	116.3gm	FAT	147.8gm	TSAT	63.0gm	TPOLY	23.6gm	TMONO	53.2gm	CHOL	353.mg
CARB	310.3gm	+SUGAR	110.1gm	ALCOH	0.0gm	CALC	1515.mg	IRON	19.4mg	MAGN	337.mg	PHOS	2077.mg
ZINC	12.76mg	POTAS	2399.mg	SODIUM	4988.mg	VITA	5316.iu	THIA	1.82mg	RIBO	2.40mg	PRENIA	31.5mg
VITB6	1.84mg	VITB12	6.23ug	AACID	115.mg	FOLA	310.ug	PACID	4.75mg				

042
AVERAGES OVER DAYS

KCALS	3915.	PROT	107.5gm	FAT	174.6gm	TSAT	73.3gm	TPOLY	30.8gm	TMONO	60.8gm	CHOL	498.mg
CARB	490.2gm	+SUGAR	180.3gm	ALCOH	0.0gm	CALC	2006.mg	IRON	28.2mg	MAGN	386.mg	PHOS	2185.mg
ZINC	14.17mg	POTAS	4215.mg	SODIUM	4423.mg	VITA	8490.iu	THIA	3.02mg	RIBO	4.55mg	PRENIA	31.5mg
VITB6	2.63mg	VITB12	10.13ug	AACID	138.mg	FOLA	464.ug	PACID	7.64mg				

011
AVERAGES OVER DAYS

KCALS	2238.	PROT	64.8gm	FAT	88.1gm	TSAT	31.2gm	TPOLY	23.2gm	TMONO	29.3gm	CHOL	169.mg
CARB	299.8gm	+SUGAR	66.6gm	ALCOH	0.0gm	CALC	1142.mg	IRON	19.8mg	MAGN	193.mg	PHOS	1224.mg
ZINC	8.15mg	POTAS	2593.mg	SODIUM	2400.mg	VITA	2422.iu	THIA	1.59mg	RIBO	1.72mg	PRENIA	16.5mg
VITB6	0.94mg	VITB12	3.06ug	AACID	60.mg	FOLA	153.ug	PACID	3.87mg				

015
AVERAGES OVER DAYS

KCALS	2460.	PROT	66.7gm	FAT	80.8gm	TSAT	29.0gm	TPOLY	13.9gm	TMONO	33.5gm	CHOL	314.mg
CARB	360.0gm	+SUGAR	103.3gm	ALCOH	0.0gm	CALC	1360.mg	IRON	14.2mg	MAGN	239.mg	PHOS	1309.mg
ZINC	7.15mg	POTAS	2382.mg	SODIUM	3519.mg	VITA	8388.iu	THIA	2.25mg	RIBO	3.17mg	PRENIA	25.4mg
VITB6	2.24mg	VITB12	3.37ug	AACID	99.mg	FOLA	463.ug	PACID	4.80mg				

084
AVERAGES OVER DAYS

KCALS	1634.	PROT	42.3gm	FAT	67.7gm	TSAT	29.6gm	TPOLY	8.7gm	TMONO	25.9gm	CHOL	322.mg
CARB	212.8gm	+SUGAR	96.0gm	ALCOH	0.0gm	CALC	982.mg	IRON	17.9mg	MAGN	144.mg	PHOS	996.mg
ZINC	4.85mg	POTAS	1108.mg	SODIUM	2036.mg	VITA	4803.iu	THIA	1.88mg	RIBO	2.50mg	PRENIA	18.8mg
VITB6	1.58mg	VITB12	6.08ug	AACID	46.mg	FOLA	262.ug	PACID	3.00mg				

087
AVERAGES OVER DAYS

KCALS	2971.	PROT	114.8gm	FAT	103.8gm	TSAT	36.6gm	TPOLY	18.0gm	TMONO	42.3gm	CHOL	311.mg
CARB	393.7gm	+SUGAR	176.1gm	ALCOH	0.0gm	CALC	1303.mg	IRON	27.6mg	MAGN	299.mg	PHOS	1808.mg
ZINC	23.36mg	POTAS	2802.mg	SODIUM	3420.mg	VITA	8538.iu	THIA	2.91mg	RIBO	3.80mg	PRENIA	38.7mg
VITB6	3.43mg	VITB12	4.66ug	AACID	91.mg	FOLA	493.ug	PACID	6.20mg				

001
AVERAGES OVER DAYS

KCALS	3166.	PROT	88.7gm	FAT	93.7gm	TSAT	31.7gm	TPOLY	20.6gm	TMONO	36.0gm	CHOL	264.mg
CARB	303.5gm	+SUGAR	275.0gm	ALCOH	0.0gm	CALC	859.mg	IRON	15.3mg	MAGN	339.mg	PHOS	1493.mg
ZINC	10.40mg	POTAS	2927.mg	SODIUM	2517.mg	VITA	3270.iu	THIA	1.67mg	RIBO	2.17mg	PRENIA	36.2mg
VITB6	2.23mg	VITB12	2.38ug	AACID	86.mg	FOLA	263.ug	PACID	5.76mg				

019

AVERAGES OVER DAYS

KCALS	1911.	PROT	101.7gm	FAT	88.1gm	TSAT	36.5gm	TPOLY	14.6gm	TMONO	31.1gm	CHOL	391.mg
CARB	179.7gm	+SUGAR	40.9gm	ALCOH	0.0gm	CALC	1299.mg	IRON	13.0mg	MAGN	252.mg	PHOS	1563.mg
ZINC	10.58mg	POTAS	2774.mg	SODIUM	2162.mg	VITA	3231.iu	THIA	1.42mg	RIBO	2.23mg	PRENIA	27.3mg
VITB6	1.89mg	VITB12	6.16ug	AACID	87.mg	FOLA	266.ug	PACID	5.59mg				

076
AVERAGES OVER DAYS

KCALS	2177.	PROT	81.5gm	FAT	93.1gm	TSAT	38.4gm	TPOLY	16.5gm	TMONO	32.9gm	CHOL	297.mg
CARB	259.6gm	+SUGAR	98.1gm	ALCOH	0.0gm	CALC	1153.mg	IRON	11.4mg	MAGN	245.mg	PHOS	1404.mg
ZINC	11.19mg	POTAS	2491.mg	SODIUM	2904.mg	VITA	6655.iu	THIA	1.60mg	RIBO	2.47mg	PRENIA	21.8mg
VITB6	1.57mg	VITB12	4.56ug	AACID	76.mg	FOLA	280.ug	PACID	5.03mg				

038
VERAGES OVER DAYS

KCALS	1973.	PROT	83.2gm	FAT	93.9gm	TSAT	47.2gm	TPOLY	11.7gm	TMONO	30.6gm	CHOL	392.mg
CARB	209.8gm	+SUGAR	58.1gm	ALCOH	0.0gm	CALC	1380.mg	IRON	12.4mg	MAGN	313.mg	PHOS	1568.mg
ZINC	10.48mg	POTAS	2847.mg	SODIUM	2219.mg	VITA	4867.iu	THIA	1.29mg	RIBO	2.44mg	PRENIA	16.1mg
VITB6	1.41mg	VITB12	5.70ug	AACID	84.mg	FOLA	307.ug	PACID	5.12mg				

030
AVERAGES OVER DAYS

KCALS	1037.	PROT	56.2gm	FAT	36.1gm	TSAT	11.8gm	TPOLY	7.2gm	TMONO	13.1gm	CHOL	115.mg
CARB	123.1gm	+SUGAR	13.8gm	ALCOH	0.0gm	CALC	769.mg	IRON	7.7mg	MAGN	166.mg	PHOS	977.mg
ZINC	8.77mg	POTAS	1701.mg	SODIUM	1557.mg	VITA	2157.iu	THIA	1.08mg	RIBO	1.28mg	PRENIA	11.7mg
VITB6	0.75mg	VITB12	2.78ug	AACID	42.mg	FOLA	132.ug	PACID	2.91mg				

017
AVERAGES OVER DAYS

KCALS	2573.	PROT	92.0gm	FAT	114.8gm	TSAT	40.9gm	TPOLY	24.8gm	TMONO	40.7gm	CHOL	485.mg
CARB	304.4gm	+SUGAR	119.1gm	ALCOH	0.0gm	CALC	759.mg	IRON	17.2mg	MAGN	363.mg	PHOS	1424.mg
ZINC	15.78mg	POTAS	3723.mg	SODIUM	2767.mg	VITA	8781.iu	THIA	1.85mg	RIBO	2.31mg	PRENIA	27.7mg
VITB6	2.95mg	VITB12	4.32ug	AACID	315.mg	FOLA	499.ug	PACID	6.57mg				

054
AVERAGES OVER DAYS

KCALS	2570.	PROT	95.4gm	FAT	96.6gm	TSAT	40.1gm	TPOLY	16.2gm	TMONO	34.0gm	CHOL	331.mg
CARB	344.5gm	+SUGAR	121.8gm	ALCOH	0.0gm	CALC	1571.mg	IRON	20.2mg	MAGN	447.mg	PHOS	1961.mg
ZINC	14.84mg	POTAS	3274.mg	SODIUM	3961.mg	VITA	8977.iu	THIA	2.22mg	RIBO	3.44mg	PRENIA	30.6mg
VITB6	3.60mg	VITB12	6.51ug	AACID	137.mg	FOLA	381.ug	PACID	6.64mg				

029
AVERAGES OVER DAYS

KCALS	1305.	PROT	46.6gm	FAT	43.0gm	TSAT	17.6gm	TPOLY	6.6gm	TMONO	15.7gm	CHOL	168.mg
CARB	194.2gm	+SUGAR	50.5gm	ALCOH	0.0gm	CALC	576.mg	IRON	24.3mg	MAGN	253.mg	PHOS	928.mg
ZINC	6.47mg	POTAS	1792.mg	SODIUM	1653.mg	VITA	6955.iu	THIA	2.20mg	RIBO	2.68mg	PRENIA	31.1mg
VITB6	3.14mg	VITB12	7.10ug	AACID	110.mg	FOLA	465.ug	PACID	3.12mg				

049
AVERAGES OVER DAYS

KCALS	2318.	PROT	104.2gm	FAT	89.7gm	TSAT	37.0gm	TPOLY	13.9gm	TMONO	32.3gm	CHOL	353.mg
CARB	279.1gm	+SUGAR	81.8gm	ALCOH	0.0gm	CALC	1692.mg	IRON	46.3mg	MAGN	305.mg	PHOS	2006.mg
ZINC	14.27mg	POTAS	2517.mg	SODIUM	3117.mg	VITA	13942.iu	THIA	3.84mg	RIBO	5.37mg	PRENIA	50.9mg
VITB6	5.29mg	VITB12	15.08ug	AACID	183.mg	FOLA	662.ug	PACID	6.15mg				

046
AVERAGES OVER DAYS

KCALS	3105.	PROT	135.3gm	FAT	165.3gm	TSAT	62.9gm	TPOLY	20.1gm	TMONO	70.9gm	CHOL	1024.mg
CARB	275.8gm	+SUGAR	31.8gm	ALCOH	0.0gm	CALC	1716.mg	IRON	43.3mg	MAGN	422.mg	PHOS	2340.mg
ZINC	19.73mg	POTAS	3787.mg	SODIUM	5443.mg	VITA	11014.iu	THIA	4.15mg	RIBO	5.41mg	PRENIA	55.9mg
VITB6	4.36mg	VITB12	16.62ug	AACID	154.mg	FOLA	659.ug	PACID	8.63mg				

073
AVERAGES OVER DAYS

KCALS	2840.	PROT	115.1gm	FAT	99.0gm	TSAT	45.4gm	TPOLY	13.0gm	TMONO	35.5gm	CHOL	282.mg
CARB	379.5gm	+SUGAR	101.9gm	ALCOH	0.0gm	CALC	2391.mg	IRON	33.4mg	MAGN	459.mg	PHOS	2485.mg
ZINC	20.69mg	POTAS	3697.mg	SODIUM	3788.mg	VITA	10906.iu	THIA	3.52mg	RIBO	5.59mg	PRENIA	41.2mg
VITB6	3.87mg	VITB12	12.38ug	AACID	117.mg	FOLA	481.ug	PACID	7.88mg				

075
AVERAGES OVER DAYS

KCALS	2101.	PROT	65.1gm	FAT	96.2gm	TSAT	39.8gm	TPOLY	15.7gm	TMONO	35.1gm	CHOL	236.mg
CARB	249.9gm	+SUGAR	87.7gm	ALCOH	0.0gm	CALC	1130.mg	IRON	12.1mg	MAGN	236.mg	PHOS	1245.mg
ZINC	9.05mg	POTAS	2411.mg	SODIUM	2056.mg	VITA	2833.iu	THIA	1.34mg	RIBO	2.09mg	PRENIA	16.4mg
VITB6	1.26mg	VITB12	3.61ug	AACID	123.mg	FOLA	225.ug	PACID	4.46mg				

077
AVERAGES OVER DAYS

KCALS	2319.	PROT	81.0gm	FAT	97.4gm	TSAT	45.4gm	TPOLY	13.9gm	TMONO	32.9gm	CHOL	342.mg
CARB	284.8gm	+SUGAR	117.7gm	ALCOH	0.0gm	CALC	1489.mg	IRON	15.8mg	MAGN	246.mg	PHOS	1545.mg
ZINC	16.56mg	POTAS	2630.mg	SODIUM	2456.mg	VITA	8371.iu	THIA	1.79mg	RIBO	2.87mg	PRENIA	21.5mg
VITB6	1.84mg	VITB12	4.97ug	AACID	99.mg	FOLA	317.ug	PACID	4.86mg				

037
AVERAGES OVER DAYS

KCALS	1628.	PROT	65.2gm	FAT	71.8gm	TSAT	22.8gm	TPOLY	19.7gm	TMONO	24.4gm	CHOL	251.mg
CARB	180.7gm	+SUGAR	46.5gm	ALCOH	0.0gm	CALC	804.mg	IRON	9.2mg	MAGN	170.mg	PHOS	1119.mg
ZINC	8.93mg	POTAS	1977.mg	SODIUM	2758.mg	VITA	4825.iu	THIA	1.10mg	RIBO	1.35mg	PRENIA	15.1mg
VITB6	1.44mg	VITB12	2.77ug	AACID	63.mg	FOLA	161.ug	PACID	3.41mg				

039

AVERAGES OVER DAYS

KCALS	2057.	PROT	64.8gm	FAT	89.3gm	TSAT	27.9gm	TPOLY	21.1gm	TMONO	34.6gm	CHOL	196.mg
CARB	250.5gm	+SUGAR	90.9gm	ALCOH	0.0gm	CALC	570.mg	IRON	15.0mg	MAGN	211.mg	PHOS	1046.mg
ZINC	12.89mg	POTAS	2150.mg	SODIUM	2486.mg	VITA	4010.iu	THIA	1.50mg	RIBO	1.76mg	PRENIA	23.0mg
VITB6	1.62mg	VITB12	2.96ug	AACID	108.mg	FOLA	271.ug	PACID	3.25mg				

045
AVERAGES OVER DAYS

KCALS	1991.	PROT	77.5gm	FAT	74.5gm	TSAT	33.7gm	TPOLY	10.9gm	TMONO	25.5gm	CHOL	257.mg
CARB	261.7gm	+SUGAR	83.0gm	ALCOH	0.0gm	CALC	1395.mg	IRON	11.1mg	MAGN	359.mg	PHOS	1566.mg
ZINC	10.36mg	POTAS	2533.mg	SODIUM	1877.mg	VITA	2880.iu	THIA	1.28mg	RIBO	2.62mg	PRENIA	16.0mg
VITB6	1.29mg	VITB12	4.75ug	AACID	117.mg	FOLA	122.ug	PACID	5.54mg				

058
AVERAGES OVER DAYS

KCALS	2424.	PROT	81.5gm	FAT	95.0gm	TSAT	36.4gm	TPOLY	17.4gm	TMONO	35.9gm	CHOL	267.mg
CARB	312.4gm	+SUGAR	89.1gm	ALCOH	0.0gm	CALC	931.mg	IRON	20.1mg	MAGN	282.mg	PHOS	1335.mg
ZINC	12.41mg	POTAS	2346.mg	SODIUM	2933.mg	VITA	7135.iu	THIA	2.07mg	RIBO	2.48mg	PRENIA	25.6mg
VITB6	1.74mg	VITB12	5.37ug	AACID	59.mg	FOLA	184.ug	PACID	4.47mg				

056
AVERAGES OVER DAYS

KCALS	2014.	PROT	89.4gm	FAT	80.7gm	TSAT	31.2gm	TPOLY	11.8gm	TMONO	31.5gm	CHOL	601.mg
CARB	234.1gm	+SUGAR	81.6gm	ALCOH	0.0gm	CALC	1038.mg	IRON	18.4mg	MAGN	212.mg	PHOS	1392.mg
ZINC	12.52mg	POTAS	1999.mg	SODIUM	2344.mg	VITA	5084.iu	THIA	1.71mg	RIBO	2.67mg	PRENIA	23.4mg
VITB6	1.96mg	VITB12	5.66ug	AACID	63.mg	FOLA	261.ug	PACID	5.78mg				

022
AVERAGES OVER DAYS

KCALS	2027.	PROT	70.0gm	FAT	92.6gm	TSAT	39.5gm	TPOLY	12.7gm	TMONO	34.3gm	CHOL	468.mg
CARB	231.3gm	+SUGAR	61.1gm	ALCOH	0.0gm	CALC	1258.mg	IRON	12.0mg	MAGN	219.mg	PHOS	1407.mg
ZINC	12.27mg	POTAS	2361.mg	SODIUM	2255.mg	VITA	3057.iu	THIA	1.26mg	RIBO	2.17mg	PRENIA	15.2mg
VITB6	1.22mg	VITB12	3.94ug	AACID	34.mg	FOLA	231.ug	PACID	4.50mg				

023
AVERAGES OVER DAYS

KCALS	2083.	PROT	64.9gm	FAT	81.9gm	TSAT	30.2gm	TPOLY	14.4gm	TMONO	31.8gm	CHOL	165.mg
CARB	276.7gm	+SUGAR	129.3gm	ALCOH	0.0gm	CALC	1092.mg	IRON	19.9mg	MAGN	249.mg	PHOS	1434.mg
ZINC	10.04mg	POTAS	1611.mg	SODIUM	2430.mg	VITA	4611.iu	THIA	1.84mg	RIBO	1.77mg	PRENIA	22.7mg
VITB6	1.85mg	VITB12	2.53ug	AACID	9.mg	FOLA	372.ug	PACID	3.55mg				

024

AVERAGES OVER DAYS

KCALS	2868.	PROT	115.2gm	FAT	127 gm	TSAT	53.6gm	TPOLY	21.6gm	TMONO	44.3gm	CHOL	660.mg
CARB	326.0gm	+SUGAR	62.8gm	ALCOH	0.0gm	CALC	2094.mg	IRON	18.3mg	MAGN	425.mg	PHOS	2186.mg
ZINC	15.98mg	POTAS	4698.mg	SODIUM	2837.mg	VITA	8249.iu	THIA	1.89mg	RIBO	3.46mg	PRENIA	21.3mg
VITB6	1.91mg	VITB12	7.13ug	AACID	177.mg	FOLA	474.ug	PACID	8.79mg				

027
AVERAGES OVER DAYS

KCALS	1455.	PROT	47.7gm	FAT	64.9gm	TSAT	23.7gm	TPOLY	13.4gm	TMONO	24.1gm	CHOL	158.mg
CARB	174.8gm	+SUGAR	76.1gm	ALCOH	0.0gm	CALC	410.mg	IRON	9.5mg	MAGN	168.mg	PHOS	717.mg
ZINC	6.95mg	POTAS	1283.mg	SODIUM	1670.mg	VITA	3351.iu	THIA	0.84mg	RIBO	0.99mg	PRENIA	15.0mg
VITB6	0.83mg	VITB12	2.24ug	AACID	65.mg	FOLA	136.ug	PACID	2.43mg				

032
AVERAGES OVER DAYS

KCALS	2084.	PROT	87.9gm	FAT	80.9gm	TSAT	34.1gm	TPOLY	10.1gm	TMONO	24.7gm	CHOL	525.mg
CARB	257.8gm	+SUGAR	53.6gm	ALCOH	0.0gm	CALC	1732.mg	IRON	19.9mg	MAGN	337.mg	PHOS	1866.mg
ZINC	14.13mg	POTAS	3071.mg	SODIUM	2395.mg	VITA	8550.iu	THIA	2.23mg	RIBO	3.73mg	PRENIA	25.5mg
VITB6	2.65mg	VITB12	7.59ug	AACID	85.mg	FOLA	401.ug	PACID	6.84mg				

004
AVERAGES OVER DAYS

KCALS	1590.	PROT	49.0gm	FAT	63.9gm	TSAT	21.0gm	TPOLY	12.9gm	TMONO	24.9gm	CHOL	472.mg
CARB	211.2gm	+SUGAR	101.6gm	ALCOH	0.0gm	CALC	569.mg	IRON	10.2mg	MAGN	203.mg	PHOS	919.mg
ZINC	7.06mg	POTAS	1223.mg	SODIUM	1876.mg	VITA	3202.iu	THIA	0.86mg	RIBO	1.15mg	PRENIA	11.7mg
VITB6	0.83mg	VITB12	2.24ug	AACID	50.mg	FOLA	200.ug	PACID	3.80mg				

010
AVERAGES OVER DAYS

KCALS	2200.	PROT	85.8gm	FAT	84.0gm	TSAT	40.8gm	TPOLY	8.4gm	TMONO	30.4gm	CHOL	328.mg
CARB	283.1gm	+SUGAR	103.4gm	ALCOH	0.0gm	CALC	1545.mg	IRON	14.4mg	MAGN	322.mg	PHOS	1760.mg
ZINC	11.85mg	POTAS	3035.mg	SODIUM	3058.mg	VITA	6611.iu	THIA	1.80mg	RIBO	2.91mg	PRENIA	18.8mg
VITB6	2.08mg	VITB12	6.32ug	AACID	107.mg	FOLA	173.ug	PACID	5.81mg				

048

AVERAGES OVER DAYS

KCALS	1604.	PROT	53.9gm	FAT	66.2gm	TSAT	25.2gm	TPOLY	13.6gm	TMONO	23.3gm	CHOL	312.mg
CARB	204.7gm	+SUGAR	95.6gm	ALCOH	0.0gm	CALC	639.mg	IRON	8.8mg	MAGN	150.mg	PHOS	856.mg
ZINC	6.90mg	POTAS	1308.mg	SODIUM	1902.mg	VITA	3918.iu	THIA	0.77mg	RIBO	1.27mg	PRENIA	11.7mg
VITB6	1.19mg	VITB12	2.48ug	AACID	48.mg	FOLA	144.ug	PACID	3.00mg				

050
AVERAGES OVER DAYS

KCALS	1884.	PROT	70.4gm	FAT	63.0gm	TSAT	29.0gm	TPOLY	7.7gm	TMONO	22.2gm	CHOL	304.mg
CARB	260.8gm	+SUGAR	113.7gm	ALCOH	0.0gm	CALC	1227.mg	IRON	15.0mg	MAGN	225.mg	PHOS	1304.mg
ZINC	14.90mg	POTAS	2192.mg	SODIUM	1855.mg	VITA	7638.iu	THIA	1.62mg	RIBO	2.48mg	PRENIA	18.8mg
VITB6	2.31mg	VITB12	4.01ug	AACID	132.mg	FOLA	290.ug	PACID	4.13mg				

074
AVERAGES OVER DAYS

KCALS	2400.	PROT	74.3gm	FAT	94.2gm	TSAT	38.8gm	TPOLY	12.4gm	TMONO	37.4gm	CHOL	378.mg
CARB	320.3gm	+SUGAR	136.1gm	ALCOH	0.0gm	CALC	1042.mg	IRON	10.3mg	MAGN	245.mg	PHOS	1398.mg
ZINC	9.27mg	POTAS	2438.mg	SODIUM	2828.mg	VITA	4524.iu	THIA	1.55mg	RIBO	1.98mg	PRENIA	17.9mg
VITB6	1.19mg	VITB12	3.96ug	AACID	145.mg	FOLA	230.ug	PACID	4.81mg				

021
AVERAGES OVER DAYS

KCALS	2101.	PROT	74.1gm	FAT	103.7gm	TSAT	43.8gm	TPOLY	15.5gm	TMONO	36.1gm	CHOL	267.mg
CARB	220.5gm	+SUGAR	94.1gm	ALCOH	0.0gm	CALC	955.mg	IRON	10.9mg	MAGN	196.mg	PHOS	1243.mg
ZINC	11.96mg	POTAS	2241.mg	SODIUM	2759.mg	VITA	3057.iu	THIA	0.92mg	RIBO	1.51mg	PRENIA	14.6mg
VITB6	1.00mg	VITB12	3.47ug	AACID	99.mg	FOLA	95.ug	PACID	3.39mg				

034

AVERAGES OVER DAYS

KCALS	1706.	PROT	74.4gm	FAT	62.5gm	TSAT	26.7gm	TPOLY	9.2gm	TMONO	22.0gm	CHOL	271.mg
CARB	213.9gm	+SUGAR	99.2gm	ALCOH	0.0gm	CALC	765.mg	IRON	8.9mg	MAGN	196.mg	PHOS	1117.mg
ZINC	8.50mg	POTAS	1686.mg	SODIUM	1586.mg	VITA	2203.iu	THIA	0.77mg	RIBO	1.57mg	PRENIA	19.4mg
VITB6	1.20mg	VITB12	3.07ug	AACID	109.mg	FOLA	95.ug	PACID	4.31mg				

052
AVERAGES OVER DAYS

KCALS	2327.	PROT	95.4gm	FAT	82.2gm	TSAT	38.1gm	TPOLY	11.2gm	TMONO	27.8gm	CHOL	374.mg
CARB	313.3gm	+SUGAR	70.8gm	ALCOH	0.0gm	CALC	1474.mg	IRON	12.2mg	MAGN	292.mg	PHOS	1648.mg
ZINC	12.06mg	POTAS	3296.mg	SODIUM	2629.mg	VITA	8251.iu	THIA	1.39mg	RIBO	2.64mg	PRENIA	19.0mg
VITB6	1.67mg	VITB12	5.29ug	AACID	78.mg	FOLA	263.ug	PACID	5.86mg				

026
AVERAGES OVER DAYS

KCALS	1835.	PROT	50.6gm	FAT	64.3gm	TSAT	27.1gm	TPOLY	8.1gm	TMONO	25.1gm	CHOL	183.mg
CARB	270.9gm	+SUGAR	102.4gm	ALCOH	0.0gm	CALC	706.mg	IRON	25.5mg	MAGN	224.mg	PHOS	905.mg
ZINC	13.11mg	POTAS	1967.mg	SODIUM	2232.mg	VITA	6037.iu	THIA	2.25mg	RIBO	2.90mg	PRENIA	28.3mg
VITB6	2.84mg	VITB12	6.01ug	AACID	207.mg	FOLA	400.ug	PACID	3.26mg				

005

AVERAGES OVER DAYS

KCALS	1575.	PROT	53.2gm	FAT	61.9gm	TSAT	25.8gm	TPOLY	9.1gm	TMONO	22.0gm	CHOL	512.mg
CARB	207.2gm	+SUGAR	45.9gm	ALCOH	0.0gm	CALC	826.mg	IRON	13.1mg	MAGN	218.mg	PHOS	1064.mg
ZINC	6.84mg	POTAS	2342.mg	SODIUM	2132.mg	VITA	3456.iu	THIA	1.23mg	RIBO	1.61mg	PRENIA	9.9mg
VITB6	1.07mg	VITB12	3.56ug	AACID	162.mg	FOLA	269.ug	PACID	4.42mg				

018
AVERAGES OVER DAYS

KCALS	2375.	PROT	83.4gm	FAT	81.3gm	TSAT	34.1gm	TPOLY	10.7gm	TMONO	30.3gm	CHOL	655.mg
CARB	342.5gm	+SUGAR	120.8gm	ALCOH	0.0gm	CALC	1335.mg	IRON	15.6mg	MAGN	345.mg	PHOS	1513.mg
ZINC	11.99mg	POTAS	3727.mg	SODIUM	1870.mg	VITA	8419.iu	THIA	1.50mg	RIBO	2.58mg	PRENIA	18.9mg
VITB6	1.72mg	VITB12	5.24ug	AACID	119.mg	FOLA	309.ug	PACID	7.05mg				

044
AVERAGES OVER DAYS

KCALS	2524.	PROT	85.1gm	FAT	103.2gm	TSAT	34.7gm	TPOLY	19.5gm	TMONO	41.0gm	CHOL	374.mg
CARB	325.8gm	+SUGAR	74.8gm	ALCOH	0.0gm	CALC	1068.mg	IRON	38.1mg	MAGN	368.mg	PHOS	1585.mg
ZINC	11.69mg	POTAS	3798.mg	SODIUM	4498.mg	VITA	12387.iu	THIA	4.21mg	RIBO	4.49mg	PRENIA	48.1mg
VITB6	4.51mg	VITB12	12.47ug	AACID	244.mg	FOLA	774.ug	PACID	6.14mg				

003

AVERAGES OVER DAYS

KCALS	2345.	PROT	67.1gm	FAT	74.8gm	TSAT	30.6gm	TPOLY	10.9gm	TMONO	28.8gm	CHOL	249.mg
CARB	354.9gm	+SUGAR	165.1gm	ALCOH	0.0gm	CALC	1164.mg	IRON	18.0mg	MAGN	234.mg	PHOS	1384.mg
ZINC	8.23mg	POTAS	2596.mg	SODIUM	2814.mg	VITA	4122.iu	THIA	2.01mg	RIBO	2.75mg	PRENIA	22.3mg
VITB6	2.02mg	VITB12	4.68ug	AACID	239.mg	FOLA	346.ug	PACID	4.46mg				

041
AVERAGES OVER DAYS

KCALS	2825.	PROT	81.2gm	FAT	97.5gm	TSAT	38.9gm	TPOLY	17.2gm	TMONO	35.0gm	CHOL	404.mg
CARB	413.6gm	+SUGAR	235.4gm	ALCOH	0.0gm	CALC	992.mg	IRON	18.0mg	MAGN	256.mg	PHOS	1568.mg
ZINC	13.86mg	POTAS	3190.mg	SODIUM	2877.mg	VITA	5743.iu	THIA	1.55mg	RIBO	1.84mg	PRENIA	18.2mg
VITB6	2.15mg	VITB12	5.08ug	AACID	181.mg	FOLA	211.ug	PACID	4.71mg				

12
AVERAGES OVER DAYS

KCALS	1346.	PROT	44.1gm	FAT	60.1gm	TSAT	21.6gm	TPOLY	14.0gm	TMONO	19.7gm	CHOL	120.mg
CARB	162.6gm	+SUGAR	28.7gm	ALCOH	0.0gm	CALC	747.mg	IRON	7.7mg	MAGN	174.mg	PHOS	894.mg
ZINC	5.93mg	POTAS	2017.mg	SODIUM	1689.mg	VITA	5948.iu	THIA	1.17mg	RIBO	1.16mg	PRENIA	9.6mg
VITB6	0.96mg	VITB12	1.90ug	AACID	148.mg	FOLA	211.ug	PACID	3.18mg				

028
AVERAGES OVER DAYS

KCALS	2825.	PROT	91.1gm	FAT	105.5gm	TSAT	39.8gm	TPOLY	17.8gm	TMONO	41.1gm	CHOL	308.mg
CARB	392.0gm	+SUGAR	117.7gm	ALCOH	0.0gm	CALC	1309.mg	IRON	17.4mg	MAGN	467.mg	PHOS	1907.mg
ZINC	11.84mg	POTAS	3333.mg	SODIUM	3859.mg	VITA	6360.iu	THIA	2.42mg	RIBO	2.93mg	PRENIA	28.7mg
VITB6	2.30mg	VITB12	4.17ug	AACID	184.mg	FOLA	454.ug	PACID	6.91mg				

013
AVERAGES OVER DAYS

KCALS	1649.	PROT	56.4gm	FAT	57.1gm	TSAT	20.0gm	TPOLY	12.7gm	TMONO	20.8gm	CHOL	154.mg
CARB	231.1gm	+SUGAR	68.6gm	ALCOH	0.0gm	CALC	675.mg	IRON	8.9mg	MAGN	183.mg	PHOS	884.mg
ZINC	6.54mg	POTAS	1741.mg	SODIUM	2124.mg	VITA	2411.iu	THIA	1.04mg	RIBO	1.32mg	PRENIA	17.4mg
VITB6	0.91mg	VITB12	2.30ug	AACID	58.mg	FOLA	147.ug	PACID	3.13mg				

020
AVERAGES OVER DAYS

KCALS	1582.	PROT	57.2gm	FAT	56.9gm	TSAT	15.8gm	TPOLY	14.2gm	TMONO	21.8gm	CHOL	285.mg
CARB	212.2gm	+SUGAR	71.6gm	ALCOH	0.0gm	CALC	406.mg	IRON	10.5mg	MAGN	166.mg	PHOS	764.mg
ZINC	8.63mg	POTAS	1676.mg	SODIUM	1703.mg	VITA	6587.iu	THIA	1.16mg	RIBO	1.17mg	PRENIA	15.9mg
VITB6	1.52mg	VITB12	2.48ug	AACID	126.mg	FOLA	153.ug	PACID	3.17mg				

053
AVERAGES OVER DAYS

KCALS	1591.	PROT	54.3gm	FAT	60.3gm	TSAT	23.7gm	TPOLY	10.4gm	TMONO	22.1gm	CHOL	214.mg
CARB	215.5gm	+SUGAR	87.3gm	ALCOH	0.0gm	CALC	588.mg	IRON	12.2mg	MAGN	201.mg	PHOS	928.mg
ZINC	7.73mg	POTAS	1868.mg	SODIUM	1464.mg	VITA	3039.iu	THIA	1.40mg	RIBO	1.80mg	PRENIA	20.0mg
VITB6	1.69mg	VITB12	3.91ug	AACID	105.mg	FOLA	240.ug	PACID	3.48mg				

014
AVERAGES OVER DAYS

KCALS	4426.	PROT	184.4gm	FAT	214.2gm	TSAT	94.2gm	TPOLY	33.3gm	TMONO	75.0gm	CHOL	1157.mg
CARB	439.1gm	+SUGAR	125.2gm	ALCOH	0.0gm	CALC	3283.mg	IRON	22.8mg	MAGN	553.mg	PHOS	3564.mg
ZINC	25.96mg	POTAS	6548.mg	SODIUM	5335.mg	VITA	7823.iu	THIA	3.28mg	RIBO	5.81mg	PRENIA	34.1mg
VITB6	3.00mg	VITB12	13.46ug	AACID	326.mg	FOLA	482.ug	PACID	12.65mg				

006
AVERAGES OVER DAYS

KCALS	1310.	PROT	69.5gm	FAT	54.5gm	TSAT	20.0gm	TPOLY	11.2gm	TMONO	19.4gm	CHOL	142.mg
CARB	139.7gm	+SUGAR	23.9gm	ALCOH	0.0gm	CALC	735.mg	IRON	9.6mg	MAGN	230.mg	PHOS	1171.mg
ZINC	8.37mg	POTAS	2281.mg	SODIUM	1731.mg	VITA	1750.iu	THIA	0.91mg	RIBO	1.16mg	PRENIA	14.7mg
VITB6	1.17mg	VITB12	2.31ug	AACID	59.mg	FOLA	185.ug	PACID	3.31mg				

031
AVERAGES OVER DAYS

KCALS	1282.	PROT	49.8gm	FAT	50.2gm	TSAT	22.6gm	TPOLY	7.0gm	TMONO	17.1gm	CHOL	336.mg
CARB	162.0gm	+SUGAR	31.3gm	ALCOH	0.0gm	CALC	1051.mg	IRON	28.3mg	MAGN	198.mg	PHOS	1170.mg
ZINC	6.06mg	POTAS	1789.mg	SODIUM	1819.mg	VITA	8576.iu	THIA	2.65mg	RIBO	3.63mg	PRENIA	30.7mg
VITB6	3.19mg	VITB12	10.92ug	AACID	106.mg	FOLA	467.ug	PACID	3.55mg				

008

AVERAGES OVER DAYS

KCALS	942.	PROT	31.3gm	FAT	46.9gm	TSAT	16.4gm	TPOLY	6.5gm	TMONO	20.8gm	CHOL	188.mg
CARB	99.1gm	+SUGAR	25.4gm	ALCOH	0.0gm	CALC	362.mg	IRON	8.1mg	MAGN	84.mg	PHOS	504.mg
ZINC	9.50mg	POTAS	871.mg	SODIUM	1937.mg	VITA	5649.iu	THIA	0.74mg	RIBO	0.69mg	PRENIA	8.5mg
VITB6	0.41mg	VITB12	1.65ug	AACID	40.mg	FOLA	130.ug	PACID	1.69mg				